

**TABLE V-12. FINE PARTICLE INDICATOR (PM<sub>2.5</sub>, SO<sub>4</sub><sup>-</sup>, H<sup>+</sup>) EFFECTS STUDIES FROM THE U.S. AND CANADA** (CD, Tables 13-4, 12-2, 12-13)

	Indicator	RR (± CI) per 25 µg/m <sup>3</sup> PM Increase	PM Levels Mean (Min/Max) <sup>†</sup>
<b>Acute Mortality</b>			
Six City <sup>A</sup>			
Portage, WI	PM <sub>2.5</sub>	1.030 (0.993, 1.071)	11.2 (±7.8)
Topeka, KS	PM <sub>2.5</sub>	1.020 (0.951, 1.092)	12.2 (±7.4)
Boston, MA	PM <sub>2.5</sub>	1.056 (1.038, 1.0711)	15.7 (±9.2)
St. Louis, MO	PM <sub>2.5</sub>	1.028 (1.010, 1.043)	18.7 (±10.5)
Kingston/Knoxville, TN	PM <sub>2.5</sub>	1.035 (1.005, 1.066)	20.8 (±9.6)
Steubenville, OH	PM <sub>2.5</sub>	1.025 (0.998, 1.053)	29.6 (±21.9)
<b>Increased Hospitalization</b>			
Ontario, CAN <sup>B</sup>	SO <sub>4</sub> <sup>-</sup>	1.03 (1.02, 1.04)	Min/Max = 3.1-8.2
Ontario, CAN <sup>C</sup>	SO <sub>4</sub> <sup>-</sup> O <sub>3</sub>	1.03 (1.02, 1.04) 1.03 (1.02, 1.05)	Min/Max = 2.0-7.7
NYC/Buffalo, NY <sup>D</sup>	SO <sub>4</sub> <sup>-</sup>	1.05 (1.01, 1.10)	NR
Toronto, CAN <sup>D</sup>	H <sup>+</sup> (Nmol/m <sup>3</sup> ) SO <sub>4</sub> <sup>-</sup> PM <sub>2.5</sub>	1.16 (1.03, 1.30)* 1.12 (1.00, 1.24) 1.15 (1.02, 1.78)	28.8 (NR/391) 7.6 (NR, 48.7) 18.6 (NR, 66.0)
<b>Increased Respiratory Symptoms</b>			
Southern California <sup>F</sup>	SO <sub>4</sub> <sup>-</sup>	1.48 (1.14, 1.91)	R = 2-37
Six Cities <sup>G</sup> (Cough)	PM <sub>2.5</sub> PM <sub>2.5</sub> Sulfur H <sup>+</sup>	1.19 (1.01, 1.42)** 1.23 (0.95, 1.59)** 1.06 (0.87, 1.29)**	18.0 (7.2, 37)*** 2.5 (3.1, 61)*** 18.1 (0.8, 5.9)***
Six Cities <sup>G</sup> (Lower Resp. Symp.)	PM <sub>2.5</sub> PM <sub>2.5</sub> Sulfur H <sup>+</sup>	1.44 (1.15-1.82)** 1.82 (1.28-2.59)** 1.05 (0.25-1.30)**	18.0 (7.2, 37)*** 2.5 (0.8, 5.9)*** 18.1 (3.1, 61)***
Denver, CO <sup>P</sup> (Cough, adult asthmatics)	PM <sub>2.5</sub> SO <sub>4</sub> <sup>-</sup> H <sup>+</sup>	0.0012 (0.0043)*** 0.0042 (.00035)*** 0.0076 (0.0038)***	0.41 - 73 0.12 - 12 2.0 - 41
<b>Decreased Lung Function</b>			
Uniontown, PA <sup>E</sup>	PM <sub>2.5</sub>	PEFR 23.1 (-0.3, 36.9) (per 25 µg/m <sup>3</sup> )	25/88 (NR/88)
Seattle, WA <sup>Q</sup> Asthmatics	b <sub>ext.</sub> calibrated by PM <sub>2.5</sub>	FEV1 42 ml (12,73) FVC 45 ml (20,70)	5/45

References:

<sup>A</sup>Schwartz et al. (1996a)

<sup>B</sup>Burnett et al. (1994)

<sup>C</sup>Burnett et al. (1995) O<sub>3</sub>

<sup>D</sup>Thurston et al. (1992, 1994)

<sup>E</sup>Neas et al. (1995)

<sup>F</sup>Ostro et al. (1993)

<sup>G</sup>Schwartz et al. (1994)

<sup>P</sup>Ostro et al. (1991)

<sup>Q</sup>Koenig et al. (1993)

<sup>‡</sup>Min/Max 24-h PM indicator level shown in parentheses unless otherwise noted as ( $\pm$  S.D.), 10 and 90 percentile (10,90).

<sup>\*</sup>Change per 100 nmoles/m<sup>3</sup>.

<sup>\*\*</sup>Change per 20  $\mu\text{g}/\text{m}^3$  for PM<sub>2.5</sub>; per 5  $\mu\text{g}/\text{m}^3$  for PM<sub>2.5</sub> sulfur; per 25 nmoles/m<sup>3</sup> for H<sup>+</sup>.

<sup>\*\*\*</sup>50th percentile value (10,90 percentile).

<sup>\*\*\*\*</sup>Coefficient and SE in parenthesis.